

**Remarks/Arguments:**

Figure 1 is objected to because boxes are not labeled descriptively. Figure 1 has been amended and now includes descriptive labels which are supported by the originally filed application. No new matter has been added.

Applicants' disclosure is directed to a robot arm for grasping an object. The robot arm determines the direction of an external force acting upon the grasped object. When the direction of the external force is determined to be another grasping force, the object is released.

On page 2 of the Office Action, claims 11 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Graham (US 5200678). It is respectfully submitted, however, that the claims are patentable over the art of record for the reasons set forth below.

Graham teaches a digit on an artificial hand that has a force sensor. The hand grasps an object and is able to measure the force that is exerted. Furthermore, the hand is able to increase or decrease its grasping force.

Applicants' invention, as recited by claim 11, includes a feature which is neither disclosed nor suggested by the art of record, namely:

**...determining a direction of an external force acting upon an object grasped...**

**...determining...the external force...is due to a first condition which is a delivery of the grasped object or a second condition which is a non-delivery of the grasped object... (emphasis added)**

Claim 11 relates to determining the direction of an external force that is applied to the object grasped by the robot arm. When an external force applied to the grasped object is detected by the robot arm, the direction of this force is determined. Furthermore, after determining the direction of the external force, it is determined whether the force is a grasping force. If the force is determined to be a grasping force, the object is delivered. If the force is determined not to be a grasping force, the

object is not delivered. This feature is found in the originally filed application at pages 12 and 13. No new matter has been added.

In column 2 lines 63-66, Graham discloses a robot arm that measures the force that the robot arm has exerted on an object ("*digits employ sensors...in response to an article being grasped*"). Graham further discloses applying a predetermined compressive force on the grasped object. This compressive force is measured by a sensor ("*causing greater tensile force...until a compressive force detected by sensing pad 72 reaches a predetermined level*"). Graham, however, does not teach determining the **direction** of an external force. Applicants' teachings are different than Graham, because the addition of determining the direction of an external force applied to the object grasped by the robot arm as recited in claim 11 ("*determining a direction of an external force acting upon an object grasped*"). The direction of the external force F is calculated on page 10 of the specification and more specifically in equation 8. It is then determined if force F is a grasping force or another force. If the force F is determined to be an external grasping force, the robot arm releases the object.

It is because Applicants' include the feature of "determining a direction of an external force", that the following advantages are achieved. An advantage is the ability to utilize the direction of the external force to determine if it is a grasping force. Accordingly, for the reasons set forth above, claim 11 is patentable over the art of record.

Claim 20 includes all the features of claim 11. Thus, claim 20 is also patentable over the art of record for the reasons set forth above.

Claims 12 and 18 include all the features of claim 11 from which they depend. Thus, claims 12 and 18 are also patentable over the art of record for the reasons set forth above.

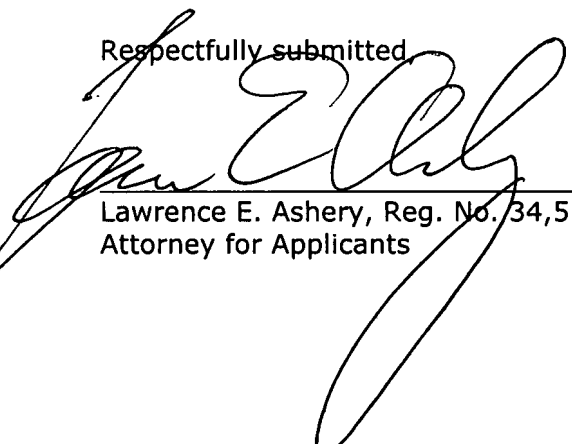
Claims 21 and 22 include all the features of claim 20 from which they depend. Thus, claims 21 and 22 are also patentable over the art of record for the reasons set forth above.

Application No.: 10/694,116  
Amendment Dated: July 13, 2007  
Reply to Final Office Action of: April 13, 2007

MAT-8478US

In view of the amendments and remarks set forth above, the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,

  
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RE/re/ds

Attachments: Figure 1 (1 sheet)

Dated: July 13, 2007

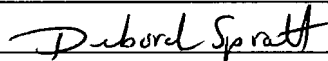
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Deborah Spratt



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**Amendments to the Drawings:**

The attached sheet of drawings includes changes to Figure 1. This sheet replaces the original sheet.

Attachment